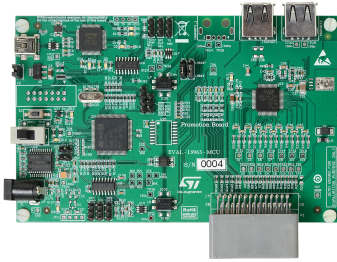


L9963 BMS IC Evaluation Board



Features

- Measures from 4 to 14 cells in series, with 0 us desynchronization delay between samples. Supports also busbar connection without altering cell results
- Coulomb counter supporting pack overcurrent detection in both ignition on and off states
- Fully synchronized current and voltage samples
- 16-bit voltage measurement
- 2.66 Mbps isolated serial communication with regenerative buffer, supporting dual access ring
- Transformer based isolation
- Up to 4 analog inputs for NTC sensing, plus PCB temperature sensing
- Onboard microcontroller SPC574S64E3 with 32-bit Power Architecture MCU for Automotive Chassis and Safety Applications
- Onboard L9001 regulator as microcontroller power supply

Description

The EVAL-L9963-MCU is a hardware tool for evaluation of L9963, automotive chip for battery management applications. It can be used for the development of a 48 V battery management system (BMS) or as lower stage of a distributed BMS (depending on total battery voltage. Additional stages can be added thanks to EVAL-L9963-NDS).

EVAL-L9963-MCU allows the user to connect up to 14 channels for cell voltage sensing, one channel for current sensing, and up to 4 analog input for temperature sensing (plus an additional on-board NTC to sense PCB temperature). The board provides an onboard microcontroller with preloaded GUI firmware intended to be used with STSW-L9963 PC Graphical User Interface.

Product summary

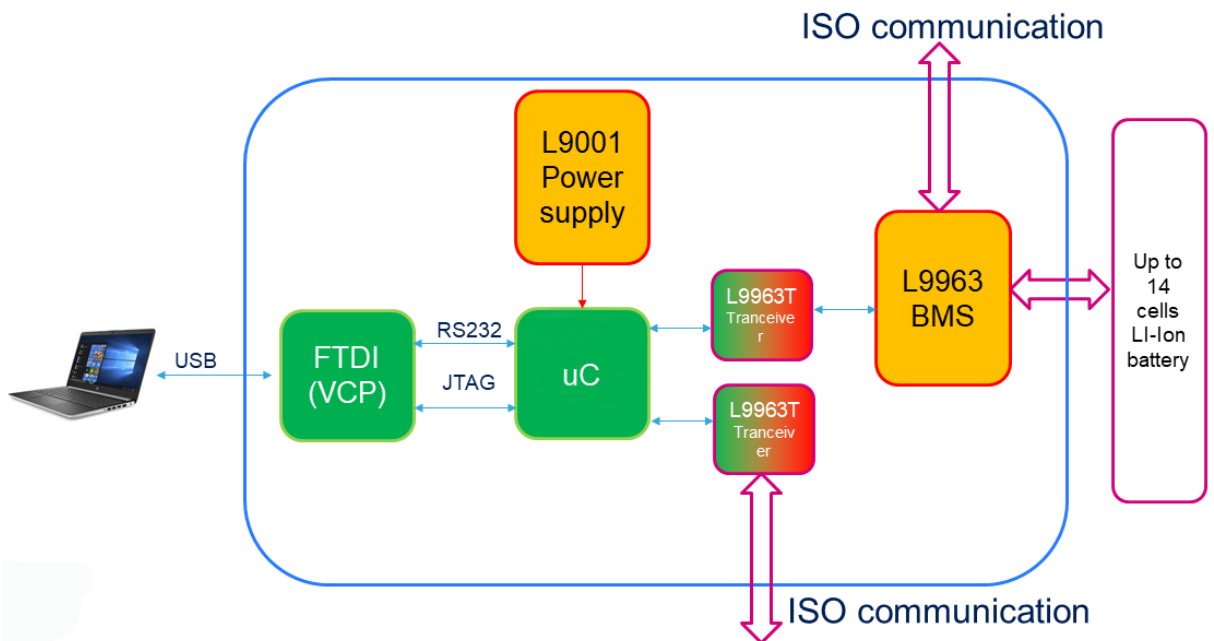
| | |
|-------------------|---------------------------------|
| Order code | EVAL-L9963-MCU |
| Reference | EVAL-L9963-MCU Evaluation board |

1 Hardware description

The EVAL-L9963-MCU board provides maximum flexibility, giving access to all pins to simplify the evaluation and debug phase of the device.

1.1 Block Diagram

Figure 1. EVAL-L9963-MCU block diagram



1.2 Featured components

The EVAL-L9963-MCU can be considered a reference design for a 48 V BMS or as a first layer of a distributed BMS system. In the following table there is a short description of all the ST featured components.

Table 1. Featured components

| Name | Description |
|-------------|--|
| L9963 | Automotive chip for battery management applications |
| L9963T | Automotive SPI to isolated SPI transceiver |
| L9001 | Automotive power supply IC with multiple voltage regulators |
| SPC574S64E3 | 32-bit Power Architecture MCU for Automotive Chassis and Safety Applications |

2 Minimum system requirements

- PC with Windows 7.0 or higher
- Mini USB to USB type A cable
- Power supply:
 - At least 3 output 0 – 30 V (if possible 60V):
 - 1 output to power L9963 (0:60 V)
 - 1 output to simulate Cells common mode voltage (0:60V)
 - 1 output to simulate Cell voltage (0:5V)

3 EVAL-L9963-MCU Evaluation board schematic

Figure 2. Board schematic: page 1

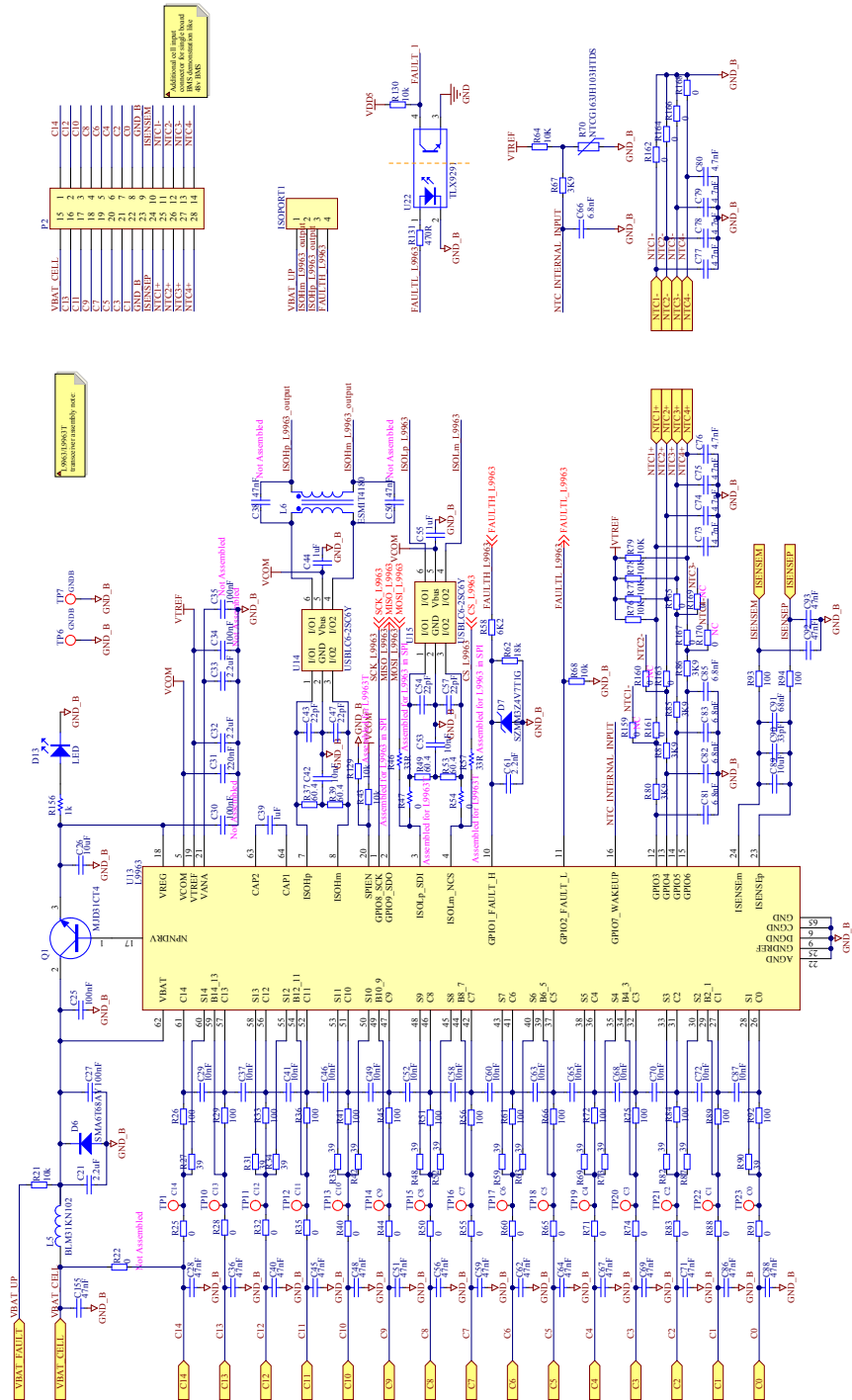


Figure 3. Board schematic: page 2

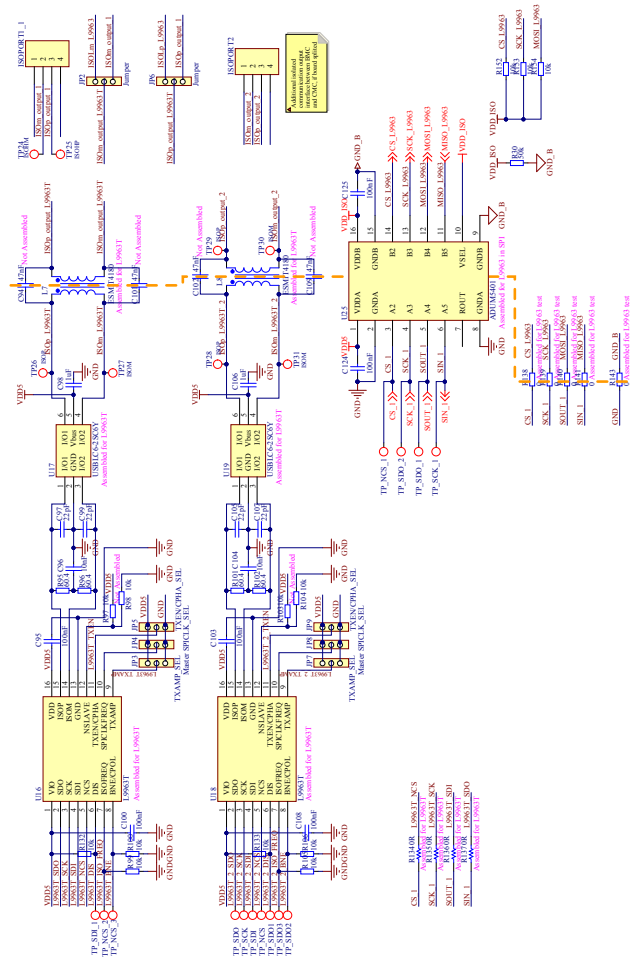


Figure 4. Board schematic: page 3

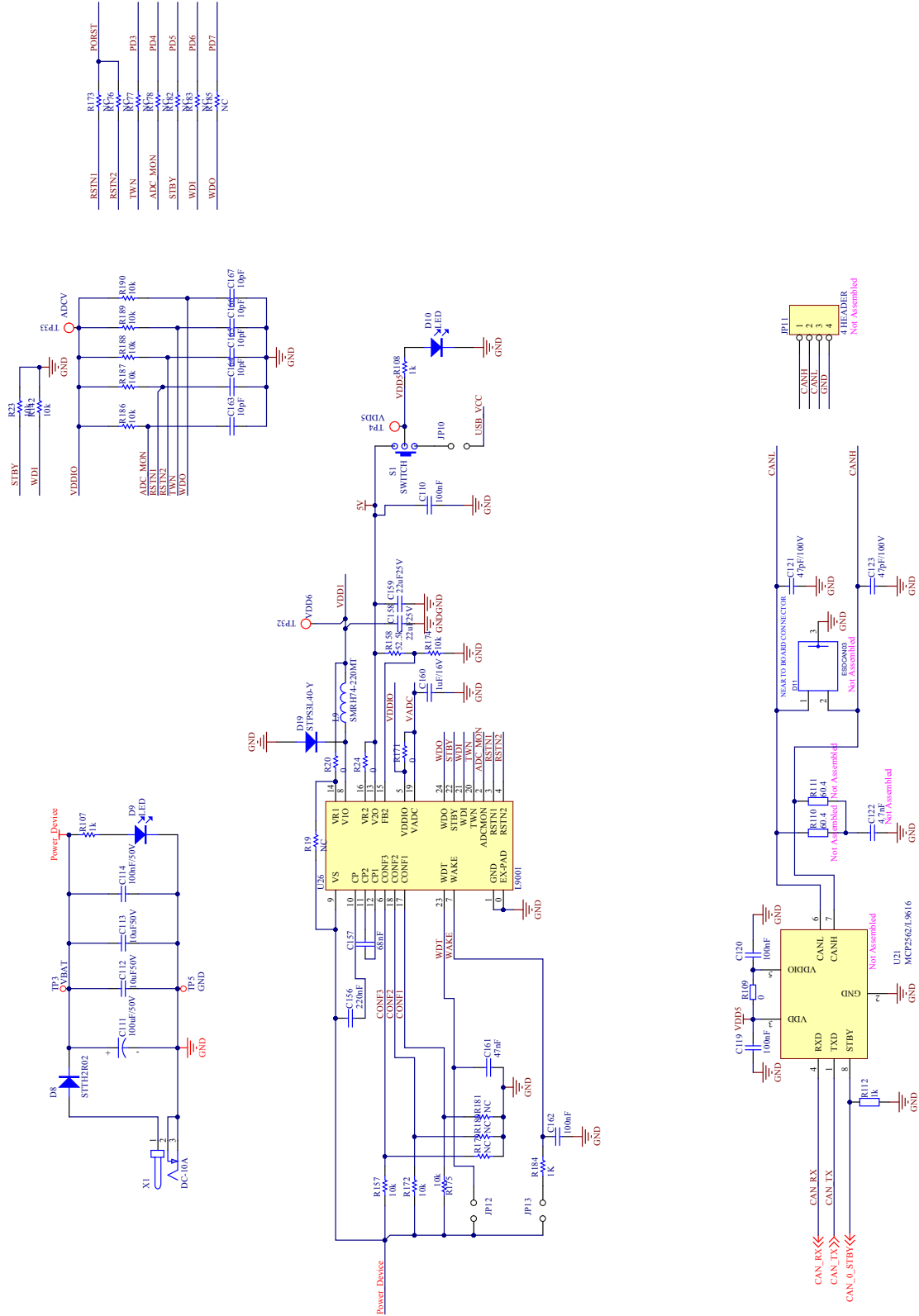
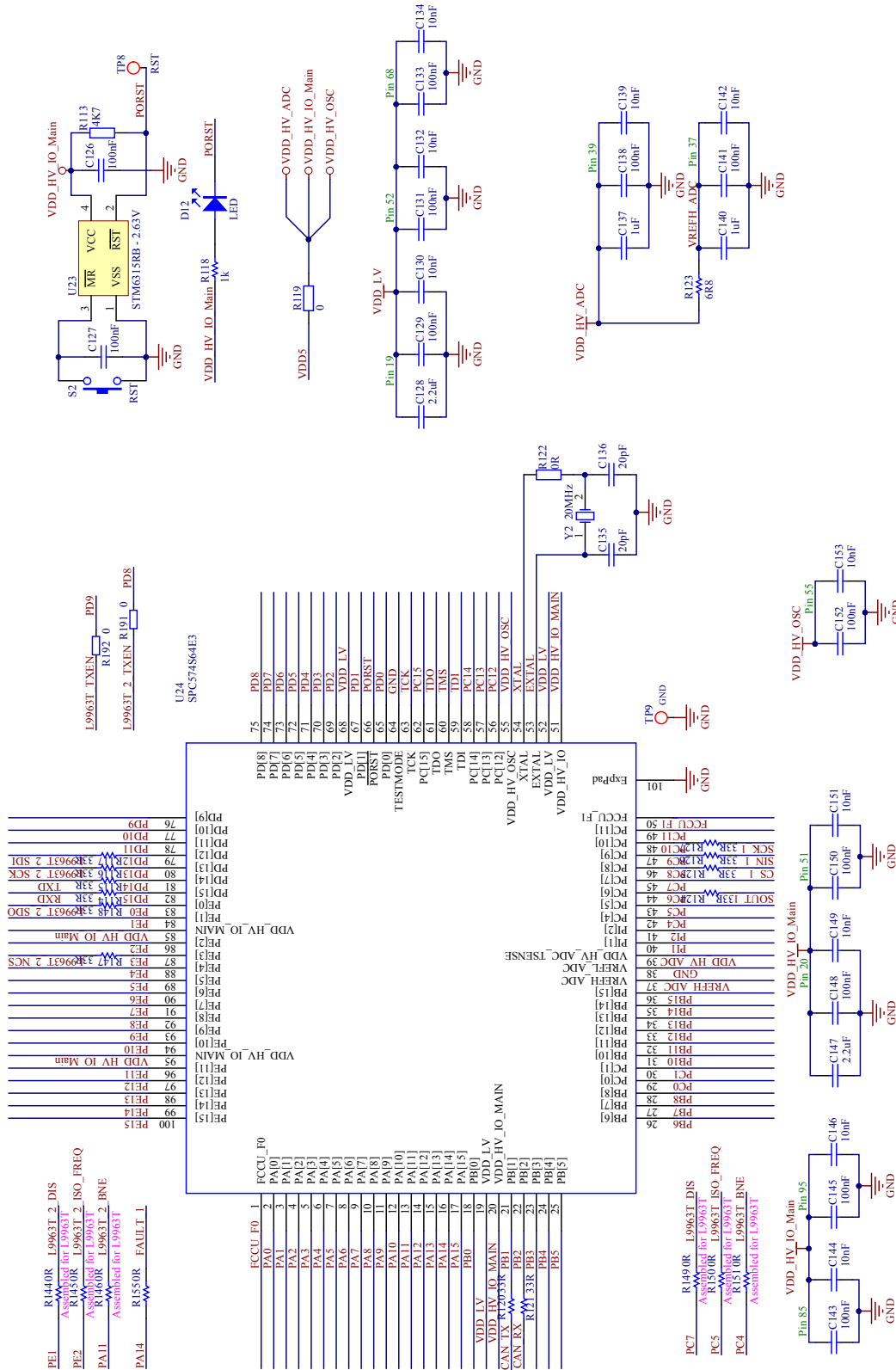


Figure 5. Board schematic: page 4



4 Board layout

Figure 7. Assembly TOP

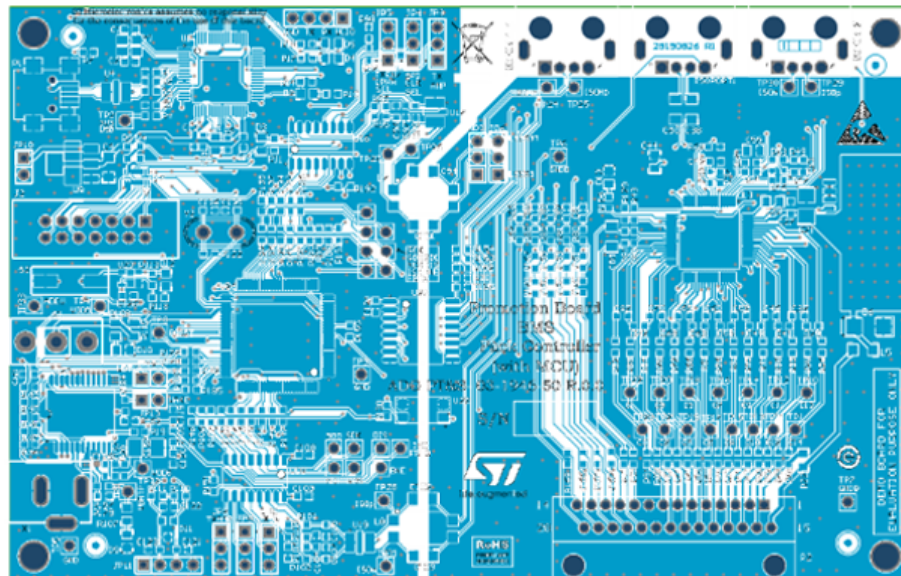


Figure 8. Inner 1

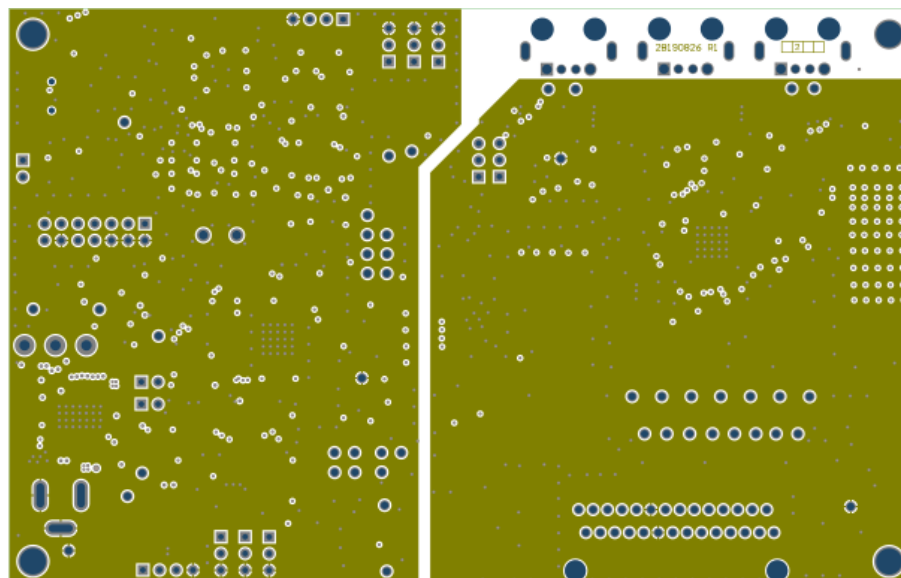


Figure 9. Inner 2

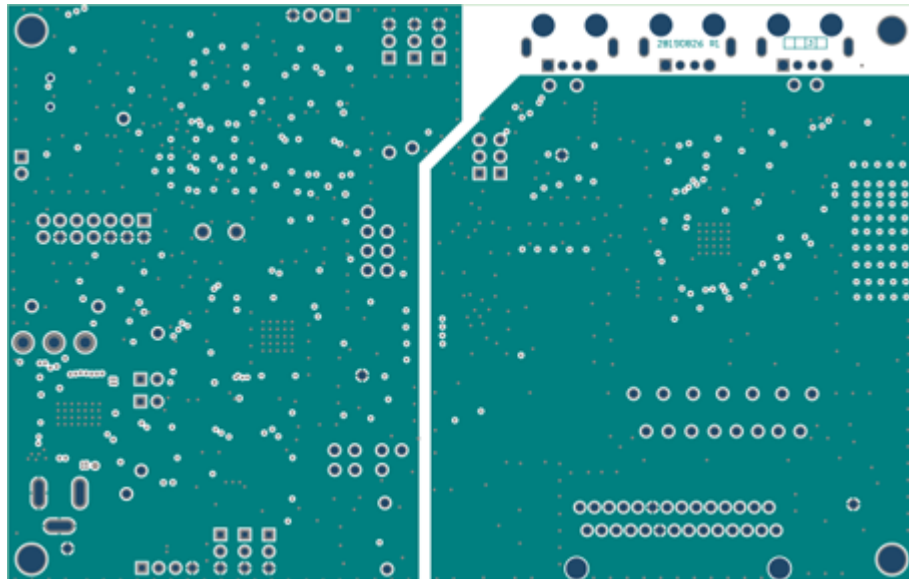
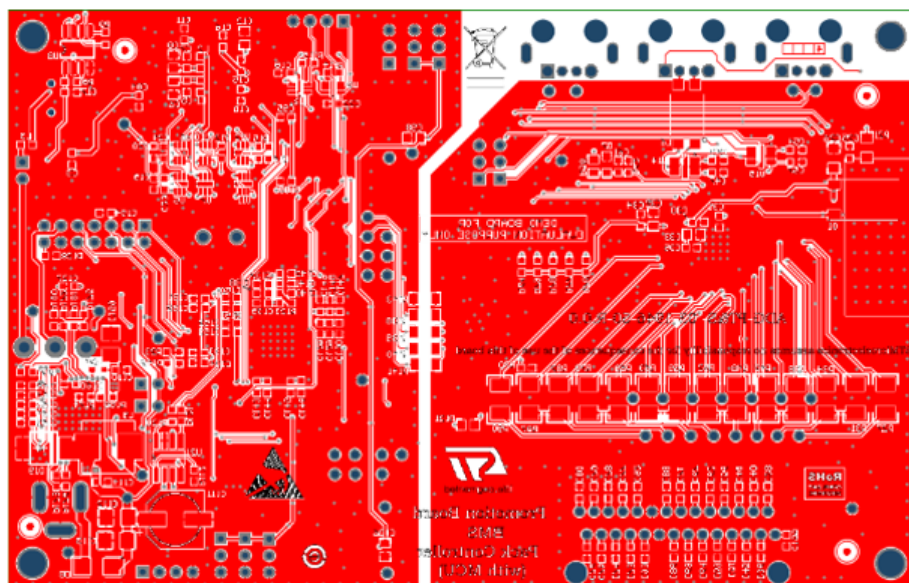


Figure 10. Assembly BOTTOM



5 Demonstration software

STSW-L9963 Software is available for demonstration purpose. For more information and download, please refer to ST website.

Revision history

Table 2. Document revision history

| Date | Version | Changes |
|-------------|---------|------------------|
| 26-Mar-2020 | 1 | Initial release. |

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